

# Developmental Dysplasia of the Hip: A Case Study to Illustrate Public Health Nursing practice

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## Abstract

Developmental Dysplasia of the Hip (DDH) captures a range of hip disorders which requires early identification and management and as such is a significant public health and primary care issue. The incidence of late diagnosis is higher in Ireland than other countries. Hip ultrasound is not widely practiced in Ireland. After birth, Public Health Nurses (PHNs) practitioners in Ireland may be the first health professional to be alerted to a missed case of DDH.

The aim of this paper is to use a case study to illustrate the complexities of public health nursing practice with parents to screen, intervene and manage DDH. The paper highlights the way in which PHNs fulfil their public health role by implementing interventions, at the level of individuals, communities and systems, to address public health issues, informed by the Public Health intervention Wheel (The Wheel). Implications for education and practice are also discussed.

**Keywords:** Public health; Nursing; Case study; Developmental dysplasia of the hip; Intervention

## Introduction

Detection of Developmental Dysplasia of the Hip (DDH) is a complex issue. The musculoskeletal disorder may be present at birth or it may develop later. Early detection and treatment is considered essential to avoid impaired hip function and premature degenerative joint disease [1]. The use of ultrasound as a screening method for DDH was first described by Graf in the 1980's [2]. Diagnosis of DDH is possible within the first few weeks of life through clinical examination by experienced clinicians and ultrasound. Ideally children should be treated by 3-4 months of age. The incidence of late diagnosis (after 3 months of age) and surgical intervention is higher in Ireland than other countries [3]. There is no national ultrasound screening programme for DDH in Ireland. Hip ultrasound examination is not widely practiced as not all regional hospitals have access to the facility for infants at 6 weeks of age (Health Service Executive (HSE) [4].

After birth, Public Health Nurse (PHNs) practitioners may be the first health professional to be alerted to a missed case of DDH. PHNs are notified of all births and interact with families at prescribed times up until children reach 3½ years of age. The child health programme provided by PHNs has a number of very important elements such as physical examination, eliciting parental concerns, assessment of risk, health education, support and guidance. PHNs use a range of interventions to accomplish the goals of child health at individual, community and systems level of practice. This paper uses a case study to discuss the complexities of public health nursing practice with parents to screen, intervene and manage DDH at these three levels of practice.

## Use of case study example in nursing practice

Many professions, including medicine, nursing, teaching and law use case study examples as a means of teaching and learning [5]. Clinical case examples are designed to represent clinical issues in the context of a client's situation. Case studies tell a story to aid and 'illustrate a point or help us to understand a situation by viewing it in real life context' (Fowler) [6]. Real life case studies are a valuable strategy for educating

practitioners and can afford instructive examples to other practitioners who might encounter similar problems.

## The need for case study examples in public health nursing practice

Public Health Nurses are generalist nurses who work within defined geographical areas delivering services to individuals, families and populations [7]. PHNs deliver primary, secondary and tertiary care in case management of clients and population groups across the life span. Caseload management enhances the visibility of the work of public health nurses (McDonald et al.) [8]. Many aspects of the PHN role are hidden and unseen and difficult to quantify i.e. decision making and judgement, counselling, assessment of individual, family and community needs and outcomes and the quality of care delivered. Poor articulation and measurement of the activities and responsibilities can lead to difficulties in articulating the boundaries of the role of the PHN [9]. The invisibility of the contribution of PHN care at individual, family and community levels has militated against evaluation of their effectiveness [10]. The use of a case study example has the potential to illustrate the complexity of PHN practice at an individual level [11].

## Case Presentation

This case here came from one interview in a larger qualitative study, which sought to understand the experiences of parents who had child growth or development concerns about their preschool children [12]. The case as represented here captures the experience of concern

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**Received** November 30, 2016; **Accepted** February 02, 2016; **Published** February 25, 2016

**Citation:** Mulcahy H, Day MR, Coleman C, O'Dwyer P, Leahy-Warren P (2016) Developmental Dysplasia of the Hip: A Case Study to Illustrate Public Health Nursing practice. Adv Practice Nurs 2:106. doi:10.4172/2573-0347.1000106

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about DDH from one mother's perspective, which is particularly useful for health care professionals who strive to adopt a person-centred approach. All identifying details have been changed to protect client confidentiality.

Pattie was in her late twenties, white Irish and lived in a newly built house in an isolated rural area with her partner and three children. Her partner was not reported to be very involved in child care issues and Pattie relied on her family who lived nearby for practical advice and support. Pattie presented as having a very practical and pragmatic approach to child care. She reported having DDH as a child and said her brother had lower limb deformity requiring protracted treatment. When her daughter Arianna, was three and a half years old (42 months), Pattie reported that her 'leg started to go in and (she) got quite clumsy'. At that time Pattie discussed her concerns with her own mother who agreed that there was something amiss with Arianna. However it was six months later when Arianna was aged 48 months old that Pattie expressed her concerns verbally to her PHN.

At that stage Pattie's PHN took a history of the concern and performed a physical examination of Arianna. At this age skin fold appearance is of limited value, legs appeared of equal length and there was nothing of significance noted in the child's gait. The PHN made a referral to the second tier clinic where Arianna was seen and examined by an Area Medical Officer (AMO) who arranged a hip X-Ray. Pattie stated that DDH was out-ruled but it was diagnosed that Arianna's hip 'was overly flexible' and a further referral was made for physiotherapy which she commenced a month later. At the time of the study interview by the researcher (HM), Arianna was aged 54 months and was happily continuing the exercises demonstrated by the physiotherapist, as she believed they were destined 'to help her be a dancer'. The rate of falling was reported by Pattie to be reducing. As a result of the anxiety provoked by this case, Pattie stated that she was following up with the PHN with an appointment for her youngest child Millie, who had not yet received her appointment for hip X-Ray, even though she was then seven months old.

## Discussion

Screening for DDH continues to be a source of much debate throughout the literature. Broadly speaking there are three approaches to screening for DDH; (a) examination by an experienced clinician, (b) a programme of universal ultrasound screening (all neonates) (c) selective screening (neonates with abnormal or suspicious clinical findings and those with risk factors for DDH). A Cochrane review was inconclusive and could not recommend universal screening as the approach increased the rate of treatment but did not result in earlier detection or surgical treatment [13]. There are questions in the literature about the value of including male infants in this approach as prevalence in this cohort is so low [14]. There is also a view that no one screening strategy will detect all DDH disorders.

There are similarities between the child health screening programmes in England, Wales and Ireland though variations exist in their focus and content. Up to 2008, screening procedures were governed by the Standing Medical Advisory Committee (SMAC) in which infants were screened 24 hours post-delivery, prior to discharge from hospital, at 6 weeks, between 6-9 months and at walking age [15]. Since the review of policy and procedures, research has found that screening infants at 8 months, as was recommended by SMAC, leads to high false positive rates and over treatment of DDH (Cooke and Kiely) [16]. In 2008 the NHS introduced the Newborn and Infant Physical Examination Committee (NIPE) (NHS) [17] which recommended

reducing screening to 72 hours post birth and at 6-8 weeks to avoid unnecessary use of services (NHS) [17]. Arising from the policy change, screening for DDH at 8 months using clinical examination by a trained health visitor is no longer recommended [16].

Ireland does not have a national ultrasound screening programme for DDH [3]. There is widespread variation in practice with regard to screening. Best Health for Children standards recommend that infants should be screened for DDH at birth by a hospital Paediatrician, community midwife or General Practitioner (GP) and again by GP (6 weeks) [18]. There are 19 neonatal units in the country, the clinician undertaking the new born hip clinical examination could be a senior house officer, an orthopedically trained registrar or a consultant paediatrician [19]. Approximately 50% of the units have access to hip ultrasound, at 6 weeks of age, whereas the remainder rely on radiography at 4-6 months of age, for detection of DDH (HSE) [4]. Currently, the National Clinical Programme for Paediatrics and Neonatology are progressing a project to develop a national targeted screening programme for infants at risk of DDH (HSE) [20].

It is a core public health nursing function to promote the health and well-being of all children in Ireland. PHN practice in preventative child health is guided by the seminal work of Dworkin [21] who described a model of developmental surveillance which contains four key elements, namely: taking a detailed history; skilled observations and examination; eliciting and attending to parental concerns; and sharing findings with parents and Health Care Professionals (HCPs). PHNs carry out five core developmental assessments in the pre-school period and as required based on assessed need. PHNs are required to raise the developmental nature of DDH with parents at the first postnatal visit. PHN's need to be vigilant as to the risk factors for DDH and ensure that children who have a family history (first degree relative) of DDH or breech delivery have the appropriate follow-up arrangements in line with local care pathways.

PHNs check for DDH at three months and 7-9 months. This assessment entails examination of any symmetry of appearance of skin folds; assessing Galeazzi's sign and assessing any limitation in abduction [18]. Children aged over one year should be observed by the PHN for any problems in relation to gait or leg length. Referrals are made for second tier services (managed by AMO) and/or specialist assessment on the basis of clinical findings and/or parental concern.

An audit of referrals by PHNs to second tier services was carried out by Pye [22] and identified that 58% (n=210) of referrals were related to hip concerns. Specifically in relation to hips, PHNs referred on the basis of unequal skin creases in the groin area. Of these cases, 51 children were sent for X-Ray, five were sent for orthopaedic consult and from those only one hip abnormality was confirmed. This was considered an ineffective use of clinic time. However it has already been identified that unequal skin creases is not a sensitive indicator of DDH [23] and it would appear from Pye's [22] audit that referrals were based on unequal creases alone.

## Implications for practice

Worldwide, PHNs are challenged to define the scope and breadth of their practice. The Intervention Wheel, a conceptual framework, serves as a structure for capturing the nature of public health nursing work with communities, individuals and families, and systems [24]. The model identifies and defines 17 public health interventions at three levels of practice; namely, individual/family, community and systems level, that contribute to the overall goal of improving population health (Table 1). The interventions in bold are those which were utilised

specifically in this case, and will be described further below.

### Community based level of practice

Working alone and in collaboration with other services PHNs screen all children in a geographical area at prescribed intervals and follow up on those who are at risk of experiencing health or developmental problems. Screening by PHNs can detect previously unknown cases of DDH in children as illustrated in the case study. For any condition to be screened it must be shown to be of importance to the population who are to be screened [25]. Phelan et al. [3] have shown that DDH is an important condition in Ireland with a high incidence of late diagnosis leading to poorer outcomes for children. Arianna's hip disorder was not found to be on the severe end of the DDH spectrum but could have affected hip development giving rise to hip deformity or osteoarthritis in the future [1]. The case also highlighted that children such as Arianna's younger sister Millie, who should have had a DDH screening appointment, because of family history can still fall through the gaps in the health services.

### Individual/family based level of practice

A public health priority that all PHNs will encounter in their daily practice with children and families is the potential for delayed presentation of DDH. Most often screening individuals can lead to case finding. Upon identification of an individual at risk for DDH, all PHNs have a role and responsibility to refer the case to a medical practitioner for further assessment. DDH case management by PHNs will involve an assessment of the family's understanding of the situation including, eliciting concerns, capabilities and resources, risk and protective factors. In the case example Pattie was aware of the family history and thus attuned to the possibility of the risk for DDH. Eliciting parental concerns and honouring their importance is necessary for effective management of DDH. As the case example shows PHNs cannot rely on parents to raise concerns. There is evidence to suggest that parents delay expressing a concern because they are uncertain and their assessments are not fully formulated [26]. Arianna was aged 48 months old when Pattie expressed her concerns verbally to her PHN. From the PHN's clinical examination of Arianna, there was no physical evidence but there was sufficient rationale on the basis of parental concern and family history of DDH to warrant a referral to the second tier clinic. Pattie also expressed her worries about the fact that she had not received an appointment for Millie's hip X-Ray, even though she was then seven months old. Given the complex interplay between child health problems and parental concerns in help seeking, it would be important for PHNs to follow up with parents to ensure that there is co-ordination of care, closing the loop, between referring and recipient clinicians. PHNs will provide counselling and health teaching, address any cultural issues and advocate on behalf of the family, as needed [27,28].

Surveillance	Consultation
Disease and other Health Investigation	Counselling
Outreach	Collaboration
Screening	Coalition Building
Case finding	Community Organising
Referral and Follow-up	Advocacy
Case Management	Social Marketing
Delegated Function	Policy Development and Enforcement
Health Teaching	

Table 1: Public Health Interventions.

### Systems-level of practice

As part of a response to an important public health issue such as DDH, at systems level, PHNs should be alert to problems in the detection and management of DDH, bring them to the attention of decision makers for the purpose of advocating for change to screening policies and procedures. PHNs can identify and collaborate with other health practitioners who might also be interested in working towards a resolution. The intent is to influence change to improve approaches to screening and ultimately better outcomes for children.

PHN managers conduct audits of practice to ascertain if PHNs are following recommended standards for DDH screening, documentation and referral to other services. In turn, managers can encourage compliance with policy and procedures through education to ensure that PHNs have the requisite knowledge and skills to provide a quality, evidence informed and effective screening programme.

PHNs should make sure that their knowledge about DDH is up to date and complete. An understanding of the natural course of history of the condition is especially important. In this particular case, the problem with Arianna's 'overly flexible' hip was not identified until she was 3½ years old. This is the course that the condition took, as nothing had been done to intervene. The case underlines the need to be sensitive to the developmental nature of DDH and the need for ongoing observation until a child is seen walking normally. Effectively identifying and managing DDH involves clinical examination by experienced practitioners (formally trained), fidelity to hip ultrasound best practice guidelines for abnormal or suspicious clinical findings and those with risk factors for DDH, a managed care pathway with surveillance.

### Conclusion

In conclusion, DDH is an important population health issue with a high incidence of late diagnosis leading to poorer outcomes in Ireland compared to other European countries. Clinical examination and selective screening are the diagnostic methods of choice for early diagnosis. Timely diagnosis is considered important to optimise treatment outcomes.

The case study illustrates that the PHN can be the first health professional to be alerted to a missed case of DDH. It is a core PHN function to ensure that all children are screened to detect previously unknown cases of DDH in a population. PHNs implement an extensive range of interventions at individual, community and systems levels that ultimately contribute to enhancing the health of populations.

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**Citation:** Mulcahy H, Day MR, Coleman C, O'Dwyer P, Leahy-Warren P (2016) Developmental Dysplasia of the Hip: A Case Study to Illustrate Public Health Nursing practice. *Adv Practice Nurs* 2:106. doi:10.4172/2573-0347.1000106

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